CLAIM AMENDMENTS

1. (original) A method for forming a solder joint in an electronic assembly having one or more copper connection sites, the method comprising the steps of:

applying a thin nickel layer to at least one copper connection site; applying a diffusion layer to the thin nickel layer; positioning lead-free solder adjacent to the diffusion layer; reflowing the solder thereby forming a solder joint at the copper connection site.

- 2. (original) A method according to claim 1 wherein the thin nickel layer is applied to a thickness of greater than about 0.05 microns.
- 3. (original) A method according to claim 1 wherein the thin nickel layer is applied to a thickness of less than about 0.05 microns.
- 4. (original) A method according to claim 1 wherein the thin nickel layer is applied to a thickness of less than about 0.28 microns.
- 5. (original) A method according to claim 1 wherein the thin nickel layer is applied to a thickness within the range of approximately 0.05 microns to approximately 0.28 microns.
- 6. (original) A method according to claim 1 wherein the diffusion layer is applied to a thickness of greater than about 0.1 microns.
- 7. (original) A method according to claim 1 wherein the diffusion layer is applied to a thickness of less than about 0.3 microns.

- 8. (original) A method according to claim 1 wherein the diffusion layer is applied to a thickness within the range of approximately 0.1 microns to approximately 0.3 microns.
- 9. (original) A method according to claim 1 wherein the diffusion layer comprises palladium.
- 10. (original) A method according to claim 1 wherein the diffusion layer comprises gold.
- 11. (original) A method according to claim 1 wherein the step of reflowing the solder further comprises the formation of a copper-tin intermetallic compound bond between the copper connection site and the solder.
- 12. (original) A method according to claim 1 wherein the step of reflowing the solder further comprises the formation of a copper-nickel-tin intermetallic compound bond between the copper connection site and the solder.
- 13. (original) A solder joint for a semiconductor apparatus assembly, wherein the assembly has at least one copper connection site, the solder joint comprising:
 - a thin nickel layer on at least one copper connection site; a diffusion layer on the thin nickel layer; and
 - lead-free solder joined to the copper connection site.
- 14. (original) A solder joint according to claim 13 wherein the solder joint further comprises a copper-tin intermetallic compound.

- 15. (original) A solder joint according to claim 13 wherein the solder joint further comprises a copper-tin-nickel intermetallic compound.
- 16. (original) A solder joint according to claim 13 wherein the thin nickel layer comprises nickel having a thickness of greater than about 0.05 microns.
- 17. (original) A solder joint according to claim 13 wherein the thin nickel layer comprises nickel having a thickness of less than about 0.28 microns.
- 18. (original) A solder joint according to claim 13 wherein the thin nickel layer comprises nickel having a thickness within a range of between approximately 0.05 microns and approximately 0.28 microns.
- 19. (original) A solder joint according to claim 13 wherein the diffusion has a thickness of greater than about 0.1 microns.
- 20. (original) A solder joint according to claim 13 wherein the diffusion layer has a thickness of less than about 0.3 microns.
- 21. (original) A solder joint according to claim 13 wherein the diffusion layer has a thickness within a range of between approximately 0.1 microns and approximately 0.3 microns.
- 22. (original) A solder joint according to claim 13 wherein the diffusion layer comprises palladium.

- 23. (original) A method according to claim 13 wherein the diffusion layer comprises gold.
- 24. (original) A solder joint for a semiconductor apparatus assembly, wherein the assembly has at least one copper connection site, the solder joint comprising:
- a thin intermetallic compound layer comprising copper-tin bonded to the copper connection site;
- a thin nickel layer bonded to the thin intermetallic compound layer; lead-free solder encapsulating the thin nickel layer and the intermetallic compound layer forming a solder joint.
- 25. (original) A solder joint according to claim 24 wherein the thin intermetallic compound layer further comprises copper-nickel-tin.
- 26. (original) A solder joint according to claim 24 wherein the lead-free solder encapsulating the thin nickel layer further comprises diffused gold.
- 27. (original) A solder joint according to claim 24 wherein the lead-free solder encapsulating the thin nickel layer further comprises diffused palladium.
- 28. (original) A solder joint according to claim 24 wherein the thin nickel layer comprises nickel having a thickness sufficient to retard the formation of copper-tin intermetallic compound over time.
- 29. (original) A solder joint according to claim 24 wherein the thin nickel layer comprises nickel having a thickness of less than about 0.28 microns.

- 30. (original) A solder joint according to claim 24 wherein the thin nickel layer comprises nickel having a thickness of greater than about 0.05 microns.
- 31. (original) A solder joint according to claim 24 wherein the thin nickel layer comprises nickel having a thickness within a range of between approximately 0.05 microns and approximately 0.28 microns.
- 32. (original) A solder joint according to claim 24 wherein the intermetallic compound layer further comprises undulations.
- 33. (original) A solder joint for a semiconductor apparatus assembly, wherein the assembly has at least one copper connection site, the solder joint comprising:
- a thin undulating intermetallic compound layer comprising copper-nickel-tin bonded to the copper connection site;
- a thin nickel layer bonded to the thin intermetallic compound layer; and solder encapsulating the thin nickel layer and the thin undulating intermetallic compound layer forming a solder joint, the solder joint further comprising a relatively small quantity of diffused palladium.
- 34. (new) A method for forming a multilayer solder attachment site in an electronic assembly having one or more copper connection sites, the method comprising the steps of:
 - applying a thin nickel layer to at least one copper connection site; applying a diffusion layer to the thin nickel layer;
- thereby forming a multilayer solder attachment site for facilitating the formation of an intermetallic compound upon the application of molten solder.

- 35. (new) A method according to claim 34 wherein the intermetallic compound comprises copper-tin.
- 36. (new) A method according to claim 34 wherein the intermetallic compound comprises copper-tin-nickel.
- 37. (new) A method according to claim 34 wherein the diffusion layer comprises palladium.
- 38. (new) A method according to claim 34 wherein the diffusion layer comprises gold.
- 39. (new) A method according to claim 34 wherein the thin nickel layer is applied to a thickness of greater than about 0.05 microns.
- 40. (new) A method according to claim 34 wherein the thin nickel layer is applied to a thickness of less than about 0.28 microns.
- 41. (new) A method according to claim 34 wherein the thin nickel layer is applied to a thickness within the range of approximately 0.05 microns to approximately 0.28 microns.
- 42. (new) A method according to claim 34 wherein the diffusion layer is applied to a thickness of greater than about 0.1 microns.
- 43. (new) A method according to claim 34 wherein the diffusion layer is applied to a thickness of less than about 0.3 microns.

- 44. (new) A method according to claim 34 wherein the diffusion layer is applied to a thickness within the range of approximately 0.1 microns to approximately 0.3 microns.
- 45. (new) A method according to claim 34 further comprising steps of interposing an intermediate nickel layer atop the copper connection site and an intermediate copper layer thereon underlying the thin nickel layer.
- 46. (new) A multilayer solder attachment site in an electronic assembly having one or more copper connection sites, the multilayer solder attachment site comprising:
 - a thin nickel layer on at least one copper connection site;
 - a diffusion layer on the thin nickel layer;
- wherein a multilayer solder attachment site is provided for facilitating the formation of an intermetallic compound upon the application of molten solder.
- 47. (new) A multilayer solder attachment site according to claim 46 wherein the multilayer solder attachment site is adapted for the formation of an intermetallic compound comprising copper-tin.
- 48. (new) A multilayer solder attachment site according to claim 46 wherein the multilayer solder attachment site is adapted for the formation of an intermetallic compound comprising copper-tin-nickel.
- 49. (new) A multilayer solder attachment site according to claim 46 wherein the diffusion layer comprises palladium.
- 50. (new) A multilayer solder attachment site according to claim 46 wherein the diffusion layer comprises gold.

- 51. (new) A multilayer solder attachment site according to claim 46 wherein the thin nickel layer is greater than about 0.05 microns in thickness.
- 52. (new) A multilayer solder attachment site according to claim 46 wherein the thin nickel layer is less than about 0.28 microns in thickness.
- 53. (new) A multilayer solder attachment site according to claim 46 wherein the thin nickel layer is within the range of approximately 0.05 microns to approximately 0.28 microns in thickness.
- 54. (new) A multilayer solder attachment site according to claim 46 wherein the diffusion layer is greater than about 0.1 microns in thickness.
- 55. (new) A multilayer solder attachment site according to claim 46 wherein the diffusion layer is less than about 0.3 microns in thickness.
- 56. (new) A multilayer solder attachment site according to claim 46 wherein the diffusion layer is within the range of approximately 0.1 microns to approximately 0.3 microns in thickness.
- 57. (new) A multilayer solder attachment site according to claim 46 further comprising an intermediate nickel layer atop the copper connection site and an intermediate copper layer thereon underlying the thin nickel layer.
- 58. (new) A multilayer solder attachment site according to claim 57 wherein the intermediate nickel layer is approximately 0.5 microns in thickness.

59. (new) A multilayer solder attachment site according to claim 57 wherein the intermediate copper layer is greater than about 0.5 microns in thickness.

60. (new) A multilayer solder attachment site according to claim 57 wherein the intermediate copper layer is less than about 1.0 microns in thickness.